Planning Assumptions and Air Quality Conformity

The 2030 Long Range Transportation Plan was developed using expected socioeconomic and land use trends and their relationship to travel demand. The implications of assumed transportation investments and future travel conditions on air quality are accounted for in the conformity analysis and determination.

Latest Planning Assumptions

The Long Range Transportation Plan and Conformity Analysis utilize the latest planning assumptions. The socioeconomic assumptions incorporate the trend land use scenario approved on May 20, 1997. The planning assumptions are less than five years old, and will remain less than five years old at the time the conformity finding is anticipated to be made and the conformity determination issued. Relevant travel model and air quality analysis assumptions have been addressed in the Conformity Analysis. The current assumptions have been reviewed by MPO and NCDOT staff and are considered valid.

Socioeconomic Assumptions

Population and employment were initially developed for 1994 based on a "windshield" survey of the planning area. With the release of the 2000 census, however, it was discovered that the previous forecasts substantially underestimated the growth in the area. To compensate, the census data and employment data collected from InfoUSA, were used to update socio-economic data for 2000. Population, household, and employment forecasts for 2014 and 2025 were revised to be consistent with these observed differences in development and growth trends. These forecasts reflect a combination of the original Existing Trends Land Use Scenario and more recent estimates published by the North Carolina State Data Center.

Table 11.1 –
Socioeconomic Forecasts

	2000	2030
Population	310,755	492,919
Employment	151,970	212,022

Trip productions and attractions (as well as the through trip table) for the LRTP update were derived by interpolation between the 2000 and 2014 data described above. Future year data are derived from these updated forecasts as well. The 2014 population and employment are unchanged from the updated forecast, other than to reflect significant unanticipated growth associated with the recently approved Reedy Fork Ranch development along US 29 in northern Guilford County. The 2020 values were linearly

interpolated from the 2014 and 2025 forecasts described above, with the addition of the Reedy Fork growth. The 2030 values were extrapolated using the same growth rates developed in the update process.

Travel Modeling

The travel model is used to support the transportation planning process with a series of analytical techniques to predict future demand. The 2030 LRTP travel model networks are built from existing networks and planned improvements documented in the fiscally constrained investment scenario presented in this document. The Greensboro Urban Area travel model is based on the four-step modeling process: trip generation, trip distribution, mode choice, and trip assignment.

The trip generation and trip distribution models were calibrated using the TRIAD origin destination survey conducted in 1994. The network assignment and transit assignment were validated using traffic counts and transit ridership counts for 1994. Traffic assignment was re-validated to 2002 counts using a 2002 interpolated model assignment.

Mode choice, which predicts the amount of travel that will be made by each mode of transportation, was not developed for the Triad Regional Model. Existing ridership levels were considered too low to warrant development of a predictive mode split model. Instead, the transit model follows the same methodology as the highway model. Although this is not a predictive model, it represents the distribution of a target ridership, expansion of existing routes, addition of new routes, potential captive ridership areas, and the resulting impacts on existing and proposed roadway systems. Transit trip generation was restricted to zones adjacent transit routes. Ridership information for each route was collected for validation and calibration purposes.

Emissions Model

NCDENR used MOBILE 6.2 to develop the emissions factors. Motor vehicle emissions controls considered in the MOBILE model are an inspections and maintenance program (as required in the North Carolina SIP). Area specific information such as vehicle age distribution and vehicle type distribution was used rather than national default values.

Development of Emissions Factors

A critical element of any emissions analysis is the development and utilization of the emissions factors applied to the travel estimates. In order to assure that the emissions factors used in the conformity analysis were compatible with those used in the

development of the North Carolina SIP, NCDENR provides emission factors and model inputs for each maintenance area in North Carolina. The Mobile 6.2 emissions factor model was used to develop the emissions factors in April 2004 and are included in Appendix A.

NCDENR provides motor vehicle emissions factors by federal functional classification. In addition the percentage of motor vehicles subject to the inspection and maintenance program is estimated from accident data.

Development of VMT mix for Mobile6 model

NCDOT provides data on VMT for six urban and six rural road types; vehicle mix data are available for the same road types. Automatic traffic recording stations and selected Highway Performance Monitoring System (HPMS) locations were used and counts taken throughout 1999 – 2001 are used to determine the percentage of vehicles, by vehicle type, for various road types. Vehicle classification data was used in conjunction with Mobile6 default vehicle mix to estimate fleet distribution by functional class. The classification data was iteratively adjusted to replicate Mobile6's national classification default within the analysis area. The final numbers reflect the change in the mix (i.e. increase in the number of SUVs and pick-ups) for each year using Mobile6 projection and variation of mix across the different road type using NC data. This reflects 16 vehicle classes per road type.

Vehicle Age Distributions

The vehicle age distribution is based on the North Carolina Department of Motor Vehicles' (DMV) registration records for the in-use fleet in the Triad area, which includes Davidson County. DMV provided the information in calendar 2000 for model years 1974 to 2000. The data was modified and arranged to comply with Mobile6.2.

Budget Test by Pollutant

The Greensboro Urban Area is a maintenance area only for ozone. USEPA approved the SIP re-designating Guilford and Davidson Counties to maintenance for ozone on November 8, 1993. Pages from the maintenance plan detailing the emissions budget are included in Appendix A.

Ozone has two precursors: oxides of nitrogen (NOX) and volatile organic compounds (VOC). The following table documents the emissions budget comparison for NOX and VOC.

Table 11.2 –
Emissions Comparison Summary for Greensboro and High Point Transportation Networks

Emissions Comparison (kg/day) [1]				
Year	NO_X		VOC	
	SIP Emissions (KG/Day)	LRTP Emissions (KG/Day)	SIP Emissions (KG/Day)	LRTP Emissions (KG/Day)
2004	30,871	29,202	18,334	16,737
2010	18,243	16,277	12,991	11,044
2014	14,914	10,531	11,884	9,819
2020	11,050	6,593	10,578	6,668
2030	11,050	5,047	10,578	5,700

[1] To obtain tons per day divide kilograms per day by 908.

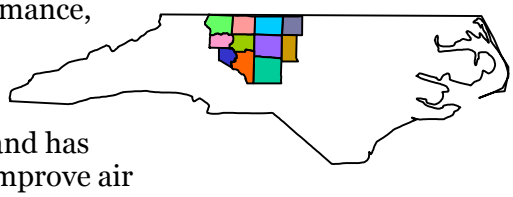
Early Action Compact

Guilford County was originally declared non-attainment for ozone (O_3) on January 6, 1992. At that time, Guilford County was classified as moderate non-attainment for ozone. On November 8, 1993, Guilford County was re-designated as maintenance under the 1-hour ozone standard.

The Clean Air Rules of 2004 went into effect on April 15, 2004. The Greensboro/Winston-Salem/High Point MSA was found to be in moderate non-attainment for the new 8-hour ozone standard. In anticipation of the new designation, the Triad formed an Early Action Compact (EAC) in 2002. This process will allow the Triad to achieve clean air earlier and with more local control than the schedule imposed by the Federal Clean Air Act.

The EAC is an option offered by the EPA that defers a region's designation as nonattainment for the 8-hour standard from December 31, 2004 to December 31, 2007 as long as all milestones are met. Compliance with the new standard must be achieved before 2007. If any milestones are not met or the air quality does not meet the 8 hour standard, the deferral will be revoked and the date of nonattainment rolled back. Until such time the Triad is still subject to the controls of the 1-hour standard.

Members of the Triad Early Action Compact include all counties and municipalities in the following eleven counties: Alamance, Caswell, Davidson, Davie, Forsyth, Guilford, Randolph, Rockingham, Stokes, Surry, and Yadkin.



The EAC submitted its Plan to EPA on March 31, 2004 and has received EPA approval. Strategies listed in the plan to improve air quality in the Triad include:

- Specify Emissions Reductions For Heavy Duty Off-Road Road Equipment In Construction Contracts
    - Develop and implement contract incentives and other policies for use of lower-emission off-road vehicles and equipment in major construction projects, especially road construction, and including NCDOT.
- Park and Ride
    - Create park and ride lots with safe parking areas and enhancements.
        - PART has a FTA grant to establish multiple regional park and ride lots by 2007.
- Carpool
    - Expand carpooling through PART website sign-ups, promotions, and advertisements.
- Mass Transit Enhancements
    - Improve existing transit systems with bus shelters, web based schedules, etc.
- Idling Reduction Efforts
    - State
        - Division of Air Quality will seek grants for installation of truck idling-reduction systems.
        - Each fleet can choose which system will work best for them (e.g. auxiliary power unit, generator, inverter-charger paired with an electrical HVAC system, other).
        - "Shore power connections" allow use of AC power at truck stops and terminals.
    - Local
        - Local systems to enact policies to reduce school bus idling.
- Support and Expand Existing Programs
    - Supplement regional services provided through the Forsyth County Environmental Affairs Department and the Triad Air Awareness Program.

  - Implement outreach programs with added emphasis on ozone season and ozone episodes at a county level.

- Place PSAs on Ads and Special Events
  - Place media ads and develop special events highlighting ozone reduction strategies and methods and green products in movie theaters, TV.
- Targeted Outreach
  - Develop special communications designed for Hispanic outreach program.
- Go into the Schools
  - Develop school-based outreach to educate children, who, in turn can inform their families.
    - Similar to the approach that worked when children educated their families about recycling.
- Media Reports
  - Increase Air Quality reports to TV, radio, newspaper, web sites, air bulletins.
- E-government/increase available locations
  - Provide telephone and web-based services for information and transactions and/or multiple locations for payments, etc.
- Intelligent Transportation Systems (ITS)
  - Local transportation departments to use detection loops and other systems that monitor traffic.
  - The system provides drivers with information such as lane closures, traffic delays and is used to reduce non-recurring congestion and associated emissions.
- Proceed with Plans for Commuter and Intercity Rail
  - PART has completed a Major Investment Study for regional commuter rail in the urban area.
  - NC DOT is studying feasibility of intercity rail from eastern to western NC, through the Triad.
  - Initiatives will be implemented post 2007.

Air Quality Conformity

The Greensboro MPO, NCDOT Transportation Planning Division, High Point MPO, Winston-Salem MPO, and North Carolina Department of Environment and Natural Resources Division of Air Quality (NCDENR DAQ) have worked cooperatively on the air quality conformity analysis for the long range transportation plan. The purpose of this analysis is to verify compliance with the provisions of the Clean Air Act Amendments of 1990 and the Transportation Equity Act for the 21st Century. The purpose of the analysis is to confirm that the fiscally constrained LRTP eliminates or reduces violations of the national ambient air quality standards (NAAQS) in Guilford County. This group completed their assessment of the LRTP in June 2004 and determined that the plan accomplishes the intent of the North Carolina State Implementation Plan (SIP). A copy of the conformity report can be found in the Appendix A.

The conformity determination was based on regional emissions analysis using the transportation network approved by the Greensboro Urban Area for the 2030 Transportation Plan and the emissions factors developed by DAQ and included analysis for the 2004, 2014, 2020 and 2030 horizon years. Each analysis year accounted for projected population and employment data as well as roadway and transit projects that will be in operation during each period. The conformity analysis concludes that the Greensboro Urban Area Transportation Plan conforms to the North Carolina SIP.